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EXAMINER	
PHAM, TUAN	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/723,855	ESSABAR, MOHAMAD	
	Examiner	Art Unit	
	TUAN A. PHAM	2618	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 November 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6,8,10,11,13-16,18-21 and 24-26* is/are rejected.

7)☒ Claim(s) *7,9,12,17,22 and 23* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *26 November 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Introduction

1. This is a response to the Applicant's filing on 11/26/2003. In virtue of this filing, claims 1-26 are currently presented in the instant application.

Information Disclosure Statement

2. The information disclosure statement (IDS) submitted on 04/13/2005 has been considered by Examiner and made of record in the application file.

Drawings

3. The drawing submitted on 11/26/2003 has been considered by Examiner and made of record in the application file.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. **Claims 21, 24-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bohm et al. (US Patent No.: 5,697,069, hereinafter, "Bohm") in view of Gomez (US Patent No.: 6,798,304).**

Regarding claim 21, Bohm teaches a method for switching modes in a wireless communication system having a resonant circuit in an antenna element, comprising: determining whether a trigger to switch modes has occurred; and for one of switching from a transmit mode to a receive mode or switching from the receive mode to the

transmit mode, selectively incorporating a frequency shift canceling component (see figure 1, switch between transmit and receive, transistor T_T is closed that include the capacitor C_T during the transmit mode, col.2, ln.48-67).

It should be noticed that Bohm fails to teach compensate for a resonant frequency shift in the resonant circuit. However, Gomez teaches compensate for a resonant frequency shift in the resonant circuit (see col.11, ln.43-45).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Gomez into view of Bohm in order to reduce the noise in the resonant circuit as suggested by Gomez at col.1, ln.17-20.

Regarding claim 24, Gomez further teaches selectively incorporating a frequency shift canceling component to compensate for a resonant frequency shift in the resonant circuit includes connecting a predetermined capacitance in parallel with respect to the tuning capacitor of the antenna when switching from the transmit mode to the receive mode (see figure 2F).

Regarding claim 25, Gomez further teaches selectively incorporating a frequency shift canceling component to compensate for a resonant frequency shift in the resonant circuit includes connecting a predetermined capacitance is series with respect to a tuning capacitor of the antenna when switching from the receive mode to the transmit mode (see figure 2F).

Regarding claim 26, Gomez further teaches selectively incorporating a frequency shift canceling component to compensate for a resonant frequency shift in

the resonant circuit includes connecting a predetermined inductance in series with the tuning capacitor and the inductive coil when switching from the transmit mode to the receive mode (see figure 2F).

6. **Claims 1-6, 8, and 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bohm et al. (US Patent No.: 5,697,069, hereinafter, "Bohm") in view of Yokoyama et al. (US Patent No.: 4,641,366, hereinafter, "Yokoyama") and further in view of Dinn et al. (US Pub. No.: 2004/0085145, hereinafter, "Dinn").**

Regarding claim 1, Bohm teaches a communication system (see figure 1), comprising:

an antenna with a resonant circuit (see figure 1, resonant circuit 3&4, col.2, ln.25-67);

means to selectively drive the resonant circuit during a transmit mode (see figure 1, transistor T_T act as a switch to select driver PA in transmit mode, col.2, col.2, ln.48-67);

means to selectively receive an induced signal in the resonant circuit during a receive mode (see figure 1, transistor T_R act as a switch to select driver LNA in receive mode, col.2, col.2, ln.25-47); and

means to selectively include a frequency shift canceling component (read on capacitor C_T) the resonant circuit to provide a first resonance frequency in the resonant circuit in the transmit mode (see figure 1, transistor T_T is closed that include the capacitor C_T during the transmit mode, col.2, ln.48-67) and a second resonance

frequency in the resonant circuit in the receive mode (see figure 1, transistor T_R is closed that include the capacitor C_R during the receive mode, col.2, ln.48-67).

It should be noticed that Bohm fails to teach the first resonance frequency and the second resonance frequency are approximately equal. However, Yokoyama teaches the first resonance frequency and the second resonance frequency are approximately equal (see col.7, ln.55-69).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Yokoyama into view of Bohm in order to improve the radio communication for suite with the broad band communication as suggested by Yokoyama at col.1, ln.48-51.

Bohm and Yokoyama, in combination, fails to teach the resonant circuit including an inductive coil connected to a tuning capacitor. However, Dinn teaches the resonant circuit including an inductive coil connected to a tuning capacitor (see figure 7, inductive coil L, tuning capacitor 38, [0066]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Dinn into view of Bohm and Yokoyama in order to provide for efficient power transfer to the load as suggested by Dinn at [0006].

Regarding claim 2, after combine, Bohm teaches the means to selectively include a frequency shift canceling component in the resonant circuit includes means to selectively exclude a predetermined parallel capacitance with respect to the capacitor when switching from the receive mode to the transmit mode,

and to selectively include the predetermined parallel capacitance with respect to the capacitor when switching from the transmit mode to the receive mode (see figure 1, col.2, ln.26-67). Dinn teaches tuning capacitor (see figure 1, tuning capacitor 38).

Regarding claim 3, after combine, Bohm teaches the means to selectively include a frequency shift canceling component in the resonant circuit includes means to selectively include a predetermined series capacitance with respect to the capacitor when switching from the receive mode to the transmit mode, and to selectively exclude the predetermined series capacitance with respect to the capacitor when switching from the transmit mode to the receive mode (see figure 1, col.2, ln.26-67). Dinn teaches tuning capacitor (see figure 1, tuning capacitor 38).

Regarding claim 4, Bohm further teaches the means to selectively include a frequency shift canceling component in the resonant circuit includes means to selectively exclude a predetermined inductance from the resonant circuit of the antenna when switching from the receive mode to the transmit mode, and to selectively include the predetermined inductance from the resonant circuit of the antenna when switching from the transmit mode to the receive mode (see figure 1, col.2, ln.26-67).

Regarding claim 5, Bohm teaches a communication system (see figure 1), comprising:

an antenna element having a first terminal (see figure 1, antenna, terminal 9), a second terminal (see figure 1, terminal 8) and a node (see figure 1, note 7), the

antenna element including a resonant circuit (resonant circuits 3&4), the resonant circuit including an inductive coil connected between the first terminal and the node (see figure 1, resonant circuit 3, inductive coil L_T, first terminal 9, node 7);

a DC blocking capacitor connected to the node of the antenna element (see figure 1, capacitor $C_{R'}$, node 7); an amplifier to be connected to the node of the antenna through the DC blocking capacitor during a receive mode to receive a first communication signal induced in the inductive coil of the resonant circuit (see figure 1, LNA, capacitor $C_{R'}$, node 7, col.2, ln.25-47);

a driver to be connected to the first terminal of the antenna element in a transmit mode to energize the inductive coil of the resonant circuit with a second communication signal (see figure 1, PA, antenna, col.2, ln.26-67);

a frequency shift canceling component (read on capacitor C_T) to be selectively included in the resonant circuit of the antenna element, the frequency shift canceling component having a predetermined value (see figure 1, capacitor C_T); and

a transmit-receive (TR) switch responsive to a control signal to include the frequency shift canceling component in the resonant circuit when switching to a first one of the transmit and receive modes (see figure 1, transistor T_T is closed that include the capacitor C_T during the transmit mode, col.2, ln.48-67), and to exclude the frequency shift canceling component in the resonant circuit when switching to a second one of the transmit and receive modes (see figure 1, transistor T_T open that exclude the capacitor C_T during the receive mode, col.2, ln.48-67).

It should be noticed that Bohm fails to teach a first resonance frequency of the resonant circuit during the receive mode and a second resonance frequency of the resonant circuit during the transmit mode are approximately equal. However, Yokoyama teaches a first resonance frequency of the resonant circuit during the receive mode and a second resonance frequency of the resonant circuit during the transmit mode are approximately equal (see col.7, ln.55-69).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Yokoyama into view of Bohm in order to improve the radio communication for suite with the broad band communication as suggested by Yokoyama at col.1, ln.48-51.

Bohm and Yokoyama, in combination, fails to teach the resonant circuit including an inductive coil connected to a tuning capacitor and a tuning capacitor connected between the second terminal and the node. However, Dinn teaches the resonant circuit including an inductive coil connected to a tuning capacitor and a tuning capacitor connected between the second terminal and the node (see figures 2&7, inductive coil L 28, tuning capacitor 38, terminal 17, it is clearly seen that the tuned resonant 12 is connect to antenna, [0066, 0098]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Dinn into view of Bohm and Yokoyama in order to provide for efficient power transfer to the load as suggested by Dinn at [0006].

Regarding claim 6, Dinn further teaches the frequency shift canceling component includes a compensation capacitor selectively connected in parallel with respect to the tuning capacitor in the receive mode (figure 2, tuning capacitor 38, capacitor 36).

Regarding claim 8, Dinn further teaches the frequency shift canceling component includes a compensation capacitor selectively connected in series with respect to the tuning capacitor in the transmit mode (figure 2, tuning capacitor 38, capacitor 36).

Regarding claim 10, Dinn further teaches the frequency shift canceling component includes a compensation inductor selectively connected in series with respect to the inductive coil and the tuning capacitor in the receive mode (see figure 5, tuning resonant 12).

Regarding claim 11, Dinn further teaches the compensation inductor and the inductive coil are formed on a single core (see figure 5, tuning resonant 12).

7. Claims 14-16 and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Julstrom et al. (US Patent No.: 7,099,486, hereinafter, "Julstrom") in view of Bohm et al. (US Patent No.: 5,697,069, hereinafter, "Bohm") and further in view of Dinn et al. (US Pub. No.: 2004/0085145, hereinafter, "Dinn").

Regarding claim 14, Julstrom teaches a hearing aid (see figure 2), comprising: a hearing aid receiver to present sound to an ear (see figure 2, speaker 206); a microphone system to receive acoustic signals (see figure 2, MIC 207); signal

processing circuitry connected to the microphone system to process received acoustic signals and present the processed signals to the hearing aid receiver (see figure 2, signal detector 212), and connected to the antenna element to process the received inductive signals (see figure 2, antenna 210, signal detector 212, col.7, ln.1-59).

It should be noticed that Julstrom fails to teach an antenna element having a first terminal, a second terminal and a node, the antenna element including a resonant circuit, the resonant circuit including an inductive coil connected between the first terminal and the node; a DC blocking capacitor connected to the node of the antenna element; an amplifier to be connected to the node of the antenna through the DC blocking capacitor during a receive mode to receive a first communication signal induced in the inductive coil of the resonant circuit; a driver to be connected to the first terminal of the antenna element in a transmit mode to energize the inductive coil of the resonant circuit with a second communication signal; a frequency shift canceling component to be selectively included in the resonant circuit of the antenna element, the frequency shift canceling component having a predetermined value; and the signal processing circuitry including a transmit-receive (TR) switch responsive to a control signal to include the frequency shift canceling component in the resonant circuit when switching to a first one of the transmit and receive modes, and to exclude the frequency shift canceling component in the resonant circuit when switching to a second one of the transmit and receive modes. However, Bohm teaches an antenna element having a first terminal (see figure 1, antenna, terminal 9), a second terminal (see figure 1, terminal 8) and a node (see figure 1, note 7), the antenna element including a resonant

circuit (resonant circuits 3&4), the resonant circuit including an inductive coil connected between the first terminal and the node (see figure 1, resonant circuit 3, inductive coil L_T, first terminal 9, node 7); a DC blocking capacitor connected to the node of the antenna element (see figure 1, capacitor $C_{R'}$, node 7); an amplifier to be connected to the node of the antenna through the DC blocking capacitor during a receive mode to receive a first communication signal induced in the inductive coil of the resonant circuit (see figure 1, LNA, capacitor $C_{R'}$, node 7, col.2, ln.25-47); a driver to be connected to the first terminal of the antenna element in a transmit mode to energize the inductive coil of the resonant circuit with a second communication signal (see figure 1, PA, antenna, col.2, ln.26-67); a frequency shift canceling component (read on capacitor C_T) to be selectively included in the resonant circuit of the antenna element, the frequency shift canceling component having a predetermined value (see figure 1, capacitor C_T); and the signal processing circuitry including a transmit-receive (TR) switch responsive to a control signal to include the frequency shift canceling component in the resonant circuit when switching to a first one of the transmit and receive modes (see figure 1, transistor T_T is closed that include the capacitor C_T during the transmit mode, col.2, ln.48-67), and to exclude the frequency shift canceling component in the resonant circuit when switching to a second one of the transmit and receive modes (see figure 1, transistor T_T open that exclude the capacitor C_T during the receive mode, col.2, ln.48-67).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Bohm into view of Julstrom

in order to provide a low insertion loss between power amplifier and antenna as suggested by Bohm at col.1, ln.24-30.

Julstrom and Bohm, in combination, fails to teach the resonant circuit including an inductive coil connected to a tuning capacitor and a tuning capacitor connected between the second terminal and the node. However, Dinn teaches the resonant circuit including an inductive coil connected to a tuning capacitor and a tuning capacitor connected between the second terminal and the node (see figures 2&7, inductive coil L 28, tuning capacitor 38, terminal 17, it is clearly seen that the tuned resonant 12 is connect to antenna, [0066, 0098]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Dinn into view of Julstron and Bohm in order to provide for efficient power transfer to the load as suggested by Dinn at [0006].

Regarding claim 15, Bohm further teaches the TR switch further includes:
a first portion to selectively connect at least one antenna terminal to a driver output during a transmit mode and to a reference potential during a receive mode;
a second portion to selectively connect an amplifier input to a node of the antenna through the DC blocking capacitor during the receive mode and to pull a node between the DC blocking capacitor and the amplifier input to the reference potential during the transmit mode (see figure 1, col.2, ln.25-67).

Regarding claim 16, Bohm further teaches the frequency shift canceling component has a predetermined value calculated to replace a DC blocking capacitor

value in determining a resonance frequency in the resonant circuit (see figure 1, col.2, ln.25-67).

Regarding claim 18, Bohm further teaches the frequency shift canceling component includes a predetermined capacitance; and the TR switch includes a transistor to selectively exclude the predetermined capacitance from the resonant circuit of the antenna when switching from the receive mode to the transmit mode, and to selectively connect the predetermined capacitance in parallel with the tuning capacitor of the antenna when switching from the transmit mode to the receive mode (see figure 1, col.2, ln.25-67).

Regarding claim 19, Bohm further teaches the frequency shift canceling component includes a predetermined capacitance; and the TR switch includes a transistor to selectively connect the predetermined capacitance in series with respect to the tuning capacitor of the antenna when switching from the receive mode to the transmit mode, and to selectively exclude the predetermined capacitance from the resonant circuit of the antenna when switching from the transmit mode to the receive mode (see figure 1, col.2, ln.25-67).

Regarding claim 20, Bohm further teaches the frequency shift canceling component includes a predetermined compensation inductor; and the TR switch includes a transistor to selectively exclude the predetermined compensation inductance from the resonant circuit of the antenna when switching from the receive mode to the transmit mode, and to selectively include the predetermined compensation inductance

from the resonant circuit of the antenna when switching from the transmit mode to the receive mode (see figure 1, col.2, ln.25-67).

8. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bohm et al. (US Patent No.: 5,697,069, hereinafter, "Bohm") in view of Yokoyama et al. (US Patent No.: 4,641,366, hereinafter, "Yokoyama") and further in view of Dinn et al. (US Pub. No.: 2004/0085145, hereinafter, "Dinn") as applied to claim 5 above, and further in view of Julstrom et al. (US Patent No.: 7,099,486, hereinafter, "Julstrom").

Regarding claim 13, Bohm, Yokoyama, and Dinn, in combination, fails to teach the communication system is incorporated in a wireless hearing aid and is adapted to inductively communicate with inductive devices. However, Julstrom teaches the communication system is incorporated in a wireless hearing aid and is adapted to inductively communicate with inductive devices (see figure 2).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Julstrom into view of Bohm, Yokoyama, and Dinn in order to reduce the magnetic noise interference as suggested by Julstrom at col.2, ln.5-10.

Allowable Subject Matter

9. Claims 7, 9, 12, 17, and 22-23 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Regarding claim 7, the applied references fails to disclose or render obvious the compensation capacitor is connected to the node of the antenna element; and the TR switch includes: means to pull the first terminal and the second terminal of the antenna element to a reference potential during the receive mode; and a transistor connected between the compensation capacitor and the reference potential, the transistor being responsive to the control signal to pull the compensation capacitor to the reference potential during the receive mode, as specified in the independent claim 7.

Regarding claim 9, the applied references fails to disclose or render obvious the compensation capacitor is connected to a first one of the first and second terminals of the antenna element, and in series with the inductive coil and the tuning capacitor; and the TR switch includes: means to pull a second one of the first and second terminals of the antenna element to a reference potential during the receive mode; and a transistor connected between the reference potential and a node between the compensation capacitor and one of the inductive coil and the tuning capacitor, wherein the compensation capacitor is connected between the transistor and the first one of the first and second terminals of the antenna element, the transistor being responsive to the control signal to pull the node to the reference potential during the receive mode such, as specified in the independent claim 9.

Regarding claim 12, the applied references fails to disclose or render obvious the inductive coil includes a center-tapped coil having a first coil portion and a second coil portion separated by a tap node, a first one of the first and second terminals of the antenna element being connected to the tap node such that a drive current flows through the first coil portion during the transmit mode; the TR switch includes: means to pull a second one of the first and second terminals of the antenna element to a reference potential during the receive mode; and a transistor connected between the second coil portion and the reference potential, the transistor being responsive to the control signal to pull the second coil portion to the reference potential during the receive mode such that both the first coil portion and the second coil portion are included in the resonant circuit of the antenna element during the receive mode, as specified in the independent claim 12.

Regarding claim 17, the applied references fails to disclose or render obvious the predetermined value of the frequency shift canceling component is calculated to further compensate for an inductance change attributable to a difference in a first current flow through the inductive coil in the transmit mode and a second current flow through the inductive coil in the receive mode, as specified in the independent claim 17.

Regarding claim 22, the applied references fails to disclose or render obvious the selectively incorporating a frequency shift canceling component to compensate for a resonant frequency shift in the resonant circuit includes compensating for a DC bypass capacitor that is a substantial component for determining resonance frequency in the

transmit mode and a relatively insubstantial component for determining resonance frequency in the receive mode, as specified in the independent claim 22.

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuan A. Pham whose telephone number is (571) 272-8097. The examiner can normally be reached on Monday through Friday, 8:30 AM-5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Anderson can be reached on (571) 272-4177. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have question on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Technology 2600
Art Unit 2618
March 11, 2008
Examiner
/TUAN A PHAM/

Tuan Pham